

CLAIMS

We claim:

1. A remote control transmitter for enabling a user to control remotely a security system, the security system having a base unit with a communication module, the remote control transmitter comprising:
 - 4 a processor;
 - 5 a display coupled to the processor to display information to the user under control of the processor;
 - 7 a first input device coupled to the processor to allow the processor to read state of the first input device, the state of the first input device being selected by the user;
 - 10 a second input device coupled to the processor to allow the processor to read state of the second input device, the state of the second input device being selected by the user;
 - 13 a transmitter coupled to the processor, the transmitter being capable of sending remote commands to the communication module of the base unit under control of the processor; and
 - 16 a memory module coupled to the processor, the memory module storing code executed by the processor;
 - 18 wherein the processor under control of the code displays to the user various menu items on the display, enables the user to scroll among the menu items to point to one of the menu items using the first input device, and enables the user to select the menu item that is pointed to by using the second input device.
- 1 2. A remote control transmitter in accordance with claim 1, wherein the transmitter sends commands to the communication module of the base unit over a wireless link.
- 1 3. A remote control transmitter in accordance with claim 2, wherein:

2 the first input device comprises a scroll wheel with an internal push-to-
3 activate switch operable by depressing and releasing the scroll wheel;
4 the user selects the state of the first input device by rotating the scroll wheel;
5 the second input device comprises the internal push-to-activate switch of the
6 scroll wheel; and
7 the user selects the state of the second user device by depressing and releasing
8 the scroll wheel.

- 1 4. A remote control transmitter in accordance with claim 3, wherein the display
2 displays the menu items one-at-a-time.
- 1 5. A remote control transmitter in accordance with claim 4, wherein one of the menu
2 items occupies no less than substantially half of the display area capable of
3 displaying menu items.
- 1 6. A remote control transmitter in accordance with claim 3, wherein the remote
2 control transmitter provides feedback to the user when the user scrolls among the
3 menu items.
- 1 7. A remote control transmitter in accordance with claim 6, wherein the scroll wheel
2 clicks when it is rotated, providing tactile and audible feedback to the user when
3 the user scrolls among the menu items.
- 1 8. A remote control transmitter in accordance with claim 7, wherein the remote
2 control transmitter provides feedback to the user when the user depresses the
3 internal press-to-activate switch of the scroll wheel.
- 1 9. A remote control transmitter in accordance with claim 8, wherein the internal
2 press-to-activate switch clicks when the user depresses the internal press-to-
3 activate switch.

- 1 10. A remote control transmitter in accordance with claim 7, wherein the transmitter
2 sends the remote commands to the communication module of the base unit over
3 an RF link.
- 1 11. A remote control transmitter in accordance with claim 10, wherein each of the
2 menu items corresponds to at least one task of a plurality of tasks, the tasks of the
3 plurality of tasks to be performed by the base unit and the remote control
4 transmitter.
- 1 12. A remote control transmitter in accordance with claim 11, wherein each task to be
2 performed by the base unit corresponds to at least one of the remote commands.
- 1 13. A remote control transmitter in accordance with claim 3, wherein:
 - 2 each of the menu items corresponds to at least one task of a plurality of tasks,
3 the tasks of the plurality of tasks to be performed by the base unit and the remote
4 control transmitter;
 - 5 each task to be performed by the base unit corresponds to at least one of the
6 remote commands;
 - 7 the menu items comprise a screen inversion menu item, the plurality of tasks
8 comprises a screen inversion task, the screen inversion menu item corresponds to
9 the screen inversion task; and
 - 10 the code executed by the processor causes the processor to perform the screen
11 inversion task and invert the display when the screen inversion menu item is
12 selected.
- 1 14. A remote control transmitter in accordance with claim 13, wherein the security
2 system is a security system installed in a vehicle.
- 1 15. A remote control transmitter in accordance with claim 14, further comprising:

2 an outer housing for containing the processor, the display, the first and second
3 input devices, the transmitter, and the memory module, the outer housing
4 comprising a top surface, a bottom surface, and sidewalls;

5 wherein:

6 the display is disposed on the top surface of the outer housing; and

7 the scroll wheel is disposed on one of the sidewalls of the outer housing and
8 protrudes from said one of the sidewalls.

1 16. A remote control transmitter in accordance with claim 15, wherein the top surface
2 of the outer housing has a longer dimension and a shorter dimension substantially
3 perpendicular to each other, the longer dimension being less than about 6 inches,
4 the shorter dimension being less than about 4 inches.

1 17. A remote control transmitter in accordance with claim 15, wherein the longest
2 dimension of the top surface of the outer housing is less than about 1.5 inches.

1 18. A remote control transmitter in accordance with claim 17, wherein the pressure
2 needed to activate the internal switch is between about .15 and .75 ounces.

1 19. A remote control transmitter in accordance with claim 14, further comprising:
2 an outer housing for housing the processor, the display, the first and second
3 input devices, the transmitter, and the memory module, the outer housing
4 comprising a top surface, a bottom surface, and sidewalls;
5 wherein:
6 the display is disposed on the top surface of the outer housing; and
7 the scroll wheel is disposed on the top surface of the outer housing and
8 protrudes from the top surface of the outer housing.

1 20. A remote control transmitter in accordance with claim 19, wherein the longest
2 dimension of the top surface of the outer housing is less than about 1.5 inches.

- 1 21. A remote control transmitter in accordance with claim 20, wherein the pressure
- 2 needed to activate the internal switch is between about .15 and .75 ounces.
- 1 22. A remote control transmitter in accordance with claim 3, further comprising a
- 2 display driver interposed between the processor and the display.
- 1 23. A remote control transmitter in accordance with claim 3, wherein:
 - 2 each of the menu items corresponds to at least one task of a plurality of tasks,
 - 3 the tasks of the plurality of tasks to be performed by the base unit and the remote
 - 4 control transmitter;
 - 5 each task to be performed by the base unit corresponds to at least one of the
 - 6 remote commands; and
 - 7 at least one of the tasks performed by the base unit is a function-programming
 - 8 task for configuring the base unit.
- 1 24. A remote control transmitter in accordance with claim 23, wherein the function-
2 programming task is selected from the list consisting of passive arming, active
3 arming, enabling confirming chirps for arm and disarm state changes, disabling
4 confirming chirps for arm and disarm state changes, turning on ignition locking of
5 doors, and turning off ignition locking of doors.
- 1 25. A remote control transmitter in accordance with claim 2, further comprising a
2 receiver coupled to the processor, the receiver being capable of receiving
3 messages containing information from the communication module of the base unit
4 and providing the messages to the processor.
- 1 26. A remote control transmitter in accordance with claim 25, wherein:
 - 2 the first input device comprises a scroll wheel with an internal push-to-
 - 3 activate switch operable by depressing and releasing the scroll wheel;
 - 4 the user selects the state of the first input device by rotating the scroll wheel;

5 the second input device comprises the internal push-to-activate switch of the
6 scroll wheel;
7 the user selects the state of the second user device by depressing and releasing
8 the scroll wheel;
9 the processor causes the display to display at least some information contained
10 in the messages; and
11 the security system is a security system installed in a vehicle.

1 27. A remote control transmitter in accordance with claim 26, wherein the
2 information in the messages contains diagnostic data.

1 28. A remote control transmitter in accordance with claim 26, wherein the
2 information in the messages contains alarm data.

1 29. A remote control transmitter in accordance with claim 1, further comprising an
2 input port capable of receiving the code executed by the processor, wherein the
3 processor reads the code from the input port and stores the code in the memory
4 module.

1 30. A remote control transmitter in accordance with claim 29, wherein the
2 information on the display comprises at least one icon determined by the code
3 read by the processor from the input port.

1 31. A remote control security system installed in a vehicle, the security system
2 comprising:
3 a base unit comprising a base controller, security sensors coupled to the base
4 controller, and a communication module; and
5 a remote control transmitter enabling a user to operate the base unit, the
6 remote control transmitter comprising:
7 a processor;

8 a display coupled to the processor to display information to the user under
9 control of the processor;

10 a first input device coupled to the processor to allow the processor to read
11 state of the first input device, the state of the first input device being selected
12 by the user;

13 a second input device coupled to the processor to allow the processor to
14 read state of the second input device, the state of the second input device
15 being selected by the user;

16 a transmitter coupled to the processor, the transmitter being capable of
17 sending remote commands to the communication module of the base unit
18 under control of the processor; and

19 a memory module coupled to the processor, the memory module storing
20 code executed by the processor;

21 wherein the processor under control of the code displays to the user
22 various menu items on the display, enables the user to scroll among the menu
23 items to point to one of the menu items using the first input device, and
24 enables the user to select the menu item that is pointed to by using the second
25 input device.

1 32. A remote control security system in accordance with claim 31, wherein:
2 the communication module and the transmitter communicate over a wireless link.

1 33. A remote control security system in accordance with claim 32, wherein:
2 the first input device comprises a scroll wheel with an internal push-to-
3 activate switch operable by depressing and releasing the scroll wheel, for enabling
4 the user to select the state of the first input device by rotating the scroll wheel; and
5 the second input device comprises the internal push-to-activate switch of the
6 scroll wheel for enabling the user to select the state of the second user device by
7 depressing the scroll wheel.

1 34. A remote control security system in accordance with claim 33, wherein the scroll
2 wheel clicks when it is rotated, thereby providing feedback to the user when the
3 user scrolls among the menu items.

1 35. A remote control security system in accordance with claim 33, wherein:
2 each of the menu items corresponds to at least one task of a plurality of tasks,
3 the tasks of the plurality of tasks to be performed by the base unit and the remote
4 control transmitter;
5 the menu items comprise a screen inversion menu item, the plurality of tasks
6 comprises a screen inversion task, the screen inversion menu item corresponds to
7 the screen inversion task; and
8 the code executed by the processor causes the processor to perform the screen
9 inversion task and invert the display when the screen inversion menu item is
10 selected.

1 36. A remote control security system in accordance with claim 33, further
2 comprising:
3 an outer housing for housing the processor, the display, the first and second
4 input devices, the transmitter, and the memory module, the outer housing
5 comprising a top surface, a bottom surface, and sidewalls;
6 wherein:
7 the display is disposed on the top surface of the outer housing; and
8 the scroll wheel is disposed on one of the sidewalls of the outer housing and
9 protrudes from said one of the sidewalls.

1 37. A remote control security system in accordance with claim 36, wherein the top
2 surface of the outer housing has a longer axis dimension and a shorter axis
3 dimension substantially perpendicular to each other, the longer axis dimension
4 being less than about 6 inches, the shorter axis dimension being less than about 4
5 inches.

1 38. A remote control security system in accordance with claim 37, wherein the
2 longest dimension of the top surface of the outer housing is less than about 1.5
3 inches.

1 39. A remote control security system in accordance with claim 38, wherein the
2 pressure needed to activate the internal switch is between about .15 and .75
3 ounces.

1 40. A remote control security system in accordance with claim 33, further
2 comprising:
3 an outer housing for housing the processor, the display, the first and second
4 input devices, the transmitter, and the memory module, the outer housing
5 comprising a top surface, a bottom surface, and sidewalls;
6 wherein:
7 the display is disposed on the top surface of the outer housing; and
8 the scroll wheel is disposed on the top surface of the outer housing and
9 protrudes from the top surface of the outer housing.

1 41. A remote control security system in accordance with claim 40, wherein the
2 longest dimension of the top surface of the outer housing is less than about 1.5
3 inches.

1 42. A remote control security system in accordance with claim 33, wherein:
2 at least two of the menu items correspond to tasks of a plurality of tasks
3 performed by the base unit and the remote control transmitter; and
4 at least one of the tasks performed by the base unit is a function-programming
5 task for configuring the base unit.

1 43. A remote control security system in accordance with claim 42, wherein the
2 function-programming task is selected from the list consisting of passive arming,
3 active arming, enabling confirming chirps for arm and disarm state changes,

4 disabling confirming chirps for arm and disarm state changes, turning on ignition
5 locking of doors, and turning off ignition locking of doors.

1 44. A remote control security system in accordance with claim 33, wherein:
2 the remote control transmitter further comprises a receiver coupled to the
3 processor, the receiver being capable of receiving messages containing
4 information from the communication module of the base unit and providing the
5 messages to the processor;
6 the processor causes the display to display at least some information contained
7 in the messages; and
8 the information in the messages contains alarm data.

1 45. A remote controller for enabling a user to control a security system installed in a
2 vehicle, the security system comprising a base unit with a communication
3 module, the remote controller comprising:
4 means for processing data;
5 means for displaying information to the user under control of the means for
6 processing;
7 first input means for assuming at least two states under control of the user, the
8 first input means being coupled to the processing means to allow the processing
9 means to read the states of the first input means;
10 second input means for assuming at least two states under control of the user,
11 the second input means being coupled to the processing means to allow the
12 processing means to read the states of the second input means;
13 a transmitter coupled to the processing means, the transmitter being capable of
14 sending remote commands over an RF link to the communication module of the
15 base unit under control of the processing means; and
16 memory means coupled to the processing means, the memory means storing
17 code executed by the processing means;
18 wherein the processing means under control of the code displays to the user
19 various menu items on the display means, allows the user to scroll among the

20 menu items to point to one of the menu items using the first input means, and
21 allows the user to select the menu item that is pointed to by using the second input
22 means.

1 46. A remote controller in accordance with claim 45, wherein:
2 the first input means comprises a scroll wheel;
3 the user selects the state of the first input means by rotating the scroll wheel;
4 the second input means comprises an internal push-to-activate switch of the
5 scroll wheel;
6 the user selects the state of the second input means by depressing and
7 releasing the scroll wheel.

1 47. A remote controller in accordance with claim 46, wherein the display means
2 displays the menu items one at a time.

1 48. A remote controller in accordance with claim 47, wherein one of the menu items
2 occupies no less than substantially half of the display area of the display means
3 capable of displaying menu items.

1 49. A remote controller in accordance with claim 46, further comprising means for
2 providing tactile feedback to the user when the user scrolls among the menu
3 items.

1 50. A remote controller in accordance with claim 46, further comprising means for
2 providing audible feedback to the user when the user scrolls among the menu
3 items.

1 51. A remote controller in accordance with claim 46, further comprising means for
2 providing feedback to the user when the user depresses the internal press-to-
3 activate switch of the scroll wheel.

1 52. A remote controller in accordance with claim 46, wherein:

2 each of the menu items corresponds to at least one task of a plurality of tasks,

3 the tasks of the plurality of tasks to be performed by the base unit and the remote

4 controller;

5 the menu items comprise a screen inversion menu item, the plurality of tasks

6 comprising a screen inversion task, the screen inversion menu item corresponding

7 to the screen inversion task; and

8 the code executed by the processing means causes the processing means to

9 perform the screen inversion task and invert the display means when the screen

10 inversion menu item is selected.

1 53. A remote controller in accordance with claim 47, further comprising an outer

2 shell means for housing the processing means, the display means, the first and

3 second input means, the transmitter, and the memory means, the outer shell means

4 being for enabling the user to hold and operate the remote control with one hand.

1 54. A remote controller in accordance with claim 53, wherein the pressure needed to

2 activate the internal switch is between about .15 and .75 ounces.

1 55. A remote controller in accordance with claim 52, wherein at least one of the tasks

2 performed by the base unit is a function-programming task for configuring the

3 base unit.

1 56. A remote controller in accordance with claim 55, wherein the function-

2 programming task is selected from the list consisting of passive arming, active

3 arming, enabling confirming chirps for arm and disarm state changes, disabling

4 confirming chirps for arm and disarm state changes, turning on ignition locking of

5 doors, and turning off ignition locking of doors.

1 57. A remote controller in accordance with claim 46, further comprising a receiver

2 coupled to the processing means, the receiver being capable of receiving

3 messages containing information from the communication module of the base unit
4 and providing the messages to the processing means.

1 58. A remote controller in accordance with claim 57, wherein the processing means
2 causes the display means to display at least some information contained in at least
3 one of the messages.

1 59. A remote controller in accordance with claim 58, wherein the information in said
2 at least one of the messages contains alarm data.

1 60. A method of operating a remote controller to control a remote controlled system
2 over a wireless link, the method comprising:
3 holding the remote controller in one hand;
4 rotating a scroll wheel with an internal push-to-activate switch with the thumb
5 of said hand to cause the remote controller to display menu items;
6 depressing the scroll wheel to select a menu item and transmit a remote
7 command associated with the selected menu item to the remote controlled system.

1 61. A method in accordance with claim 60, wherein:
2 the remote controlled system comprises an automotive security system; and
3 said rotating step comprises the step of causing the remote controller to display
4 menu items one-at-a-time.

1 62. A menu-driven remote control for operating a controlled system over a wireless
2 link, the remote control comprising:
3 a hand-held general-purpose computing device comprising:
4 a first interface section,
5 a manual input portion,
6 a memory module,
7 a graphical display, and

8 a controller coupled to the first interface section, the manual input portion, the
9 memory module, and the graphical display, the controller executing instruction
10 code; and

11 a wireless communication module comprising a second interface section and a
12 transmitter coupled to the second interface section, the second interface section being
13 coupled to the first interface section through a digital bus, the transmitter being
14 capable of sending a plurality of remote commands to the controlled system over the
15 wireless link, the remote commands instructing the controlled system to perform
16 various operations;

17 wherein:

18 the controller under control of the instruction code displays, on the graphical
19 display, to the user, various menu items of a plurality of menu items;

20 each menu item of a first subset of the plurality of menu items is associated
21 with at least one remote command of the plurality of remote commands;

22 the controller under control of the instruction code enables the user to scroll
23 among the menu items to point to and select one of the menu items using the
24 manual input portion; and

25 the controller under control of the instruction code communicates with the
26 transmitter via the first interface section, the digital bus, and the second interface
27 section, to direct the transmitter to send remote commands associated with the
28 menu items selected by the user to the controlled system.

1 63. A menu-driven remote control according to claim 62, wherein:

2 the hand-held general-purpose computing device further comprises an
3 electrical power source for operating the hand-held general purpose computing
4 device and for providing electrical power to the wireless communication module.

5 64. A remote control security and entertainment system installed in a vehicle, the
6 system comprising:

7 a base unit comprising a base controller, security sensors coupled to the base
8 controller, a video entertainment module with a plurality of functions, and a
9 communication module; and
10 a remote controller enabling a user to operate the base unit, the remote
11 controller comprising:
12 a processor;
13 a display coupled to the processor to display information to the user under
14 control of the processor;
15 a first input device coupled to the processor to allow the processor to read
16 state of the first input device, the state of the first input device being selected
17 by the user;
18 a second input device coupled to the processor to allow the processor to read
19 state of the second input device, the state of the second input device
20 being selected by the user;
21 a transmitter coupled to the processor, the transmitter being capable of
22 sending remote commands to the communication module of the base unit
23 under control of the processor;
24 a memory module coupled to the processor, the memory module storing
25 code executed by the processor; and
26 an input port capable of receiving the code executed by the processor;
27 wherein:
28 the processor reads the code from the input port and stores the code in the
29 memory module;
30 the processor under control of the code displays to the user a plurality of menu
31 items on the display, enables the user to scroll among the menu items to point to one
32 of the menu items using the first input device, and enables the user to select the menu
33 item that is pointed to by using the second input device, at least one of the menu items
34 allowing the user to select a function of the video entertainment module.
35 65. A remote control security and positioning system installed in a vehicle, the system
36 comprising:

37 a base unit comprising a base controller, security sensors coupled to the base
38 controller, a global positioning module with a plurality of functions, and a
39 communication module; and
40 a remote controller enabling a user to operate the base unit, the remote
41 controller comprising:
42 a processor;
43 a display coupled to the processor to display information to the user under
44 control of the processor;
45 a first input device coupled to the processor to allow the processor to read
46 state of the first input device, the state of the first input device being selected
47 by the user;
48 a second input device coupled to the processor to allow the processor to read
49 state of the second input device, the state of the second input device
50 being selected by the user;
51 a transmitter coupled to the processor, the transmitter being capable of
52 sending remote commands to the communication module of the base unit
53 under control of the processor;
54 a memory module coupled to the processor, the memory module storing
55 code executed by the processor; and
56 an input port capable of receiving the code executed by the processor;
57 wherein:
58 the processor reads the code from the input port and stores the code in the
59 memory module;
60 the processor under control of the code displays to the user a plurality of menu
61 items on the display, enables the user to scroll among the menu items to point to one
62 of the menu items using the first input device, and enables the user to select the menu
63 item that is pointed to by using the second input device, at least one of the menu items
64 allowing the user to select a function of the global positioning module.